Response to Office Action of May 25, 2006

## **AMENDMENTS TO THE CLAIMS**

1. (Currently Amended) A cyanine dye having the formula:

wherein  $A_1$  and  $A_2$  are each independently O, S or N, and R is H or a earbohydrate <u>hydrocarbon</u>, optionally containing a heteroatom, and m is an integer from 0 to 5, and n is an integer from 0 to 5.

2. (Original) The cyanine dye of claim 1, wherein R is methyl or ethyl, and m is 1 and n is 0.

Docket No.: 2921-0150PUS1

Page 2 of 12

Application No.: 10/605,961

Reply of October 25, 2006

Response to Office Action of May 25, 2006

Docket No.: 2921-0150PUS1

Page 3 of 12

3. (Original) The cyanine dye of claim 1, wherein R is methyl or ethyl, m is 1 and n is 0,

and A<sub>1</sub> and A<sub>2</sub> are S.

4. (Original) The cyanine dye of claim 1, wherein R is methyl or ethyl, m is 1 and n is 0,

and  $A_1$  and  $A_2$  are O.

5. (Original)The cyanine dye of claim 1, wherein R is methyl or ethyl, m is 1 and n is 0,

 $A_1$  is S and  $A_2$  is O.

6. (Currently Amended) A hybridization probe comprising a sequence-recognizing

nucleic acid portion and a reporter portion, wherein the reporter portion comprises a cyanine dye

having the formula:

Application No.: 10/605,961 Docket No.: 2921-0150PUS1
Reply of October 25, 2006 Page 4 of 12

Response to Office Action of May 25, 2006

wherein  $A_1$  and  $A_2$  are each independently O, S or N, and R is H or a earbohydrate hydrocarbon, optionally containing a heteroatom, and m is an integer from 0 to 5, and n is an integer from 0 to 5.

- 7. (Original) The probe of claim 6, wherein R is methyl or ethyl, and m is 1 and n is 0.
- 8. (Original) The probe of claim 6, wherein R is methyl or ethyl, m is 1 and n is 0, and  $A_1$  and  $A_2$  are S.

9. (Original) The probe of claim 6, wherein R is methyl or ethyl, m is 1 and n is 0, and  $A_1$  and  $A_2$  are O.

- 10. (Original) The probe of claim 6, wherein R is methyl or ethyl, m is 1 and n is 0,  $A_1$  is S and  $A_2$  is O.
- 11. (Currently Amended) A method for detecting the presence of double-stranded DNA in a sample comprising the steps of: introducing into the sample a cyanine dye having the formula:

Application No.: 10/605,961 Docket No.: 2921-0150PUS1 Reply of October 25, 2006

Response to Office Action of May 25, 2006

wherein A<sub>1</sub> and A<sub>2</sub> are each independently O, S or N, and R is H or a earbohydrate

hydrocarbon, optionally containing a heteroatom, and m is an integer from 0 to 5, and n is an

integer from 0 to 5; and detecting fluorescence from the cyanine dye, wherein the fluorescence

intensity from the cyanine dye is increased in the presence of double-stranded DNA as a result of

binding of the cyanine dye in the minor groove of the double-stranded DNA.

12. (Original) The method of claim 11, wherein R is methyl or ethyl, and m is 1 and n is

0.

13. (Original) The method of claim 11, wherein R is methyl or ethyl, m is 1 and n is 0,

and  $A_1$  and  $A_2$  are S.

14. (Original) The method of claim 11, wherein R is methyl or ethyl, m is 1 and n is 0,

and  $A_1$  and  $A_2$  are O.

15. (Original) The method of claim 11, wherein R is methyl or ethyl, m is 1 and n is 0, A<sub>1</sub>

is S and  $A_2$  is O.

16. (Withdrawn) A method for monitoring a real time PCR reaction by detection of the

formation of double-stranded DNA, comprising the steps of performing real time PCR in the

presence of a fluorescent dye that interacts with double-stranded DNA, and monitoring

KM/REG/ktp

Page 6 of 12

Application No.: 10/605,961

Reply of October 25, 2006

Response to Office Action of May 25, 2006

Docket No.: 2921-0150PUS1

Page 7 of 12

fluorescence from the fluorescent dye, wherein the fluorescent dye increases its fluorescent

intensity when it is locked in a minor groove position in double stranded DNA, and wherein the

dye comprises at least 2 aromatic ring systems both comprising at least one nitrogen atom, which

rings are linked by a alkyne group having up to four carbon atoms to form a conjugated bond,

and the dye further comprises at least a third aromatic system linked thereto via a bond having a

significant double string character, such as a single bond or a ethyne bond, to provide a stiff

conjugated system.

17. (Withdrawn) The method of claim 16, wherein the dye is an asymmetric evanine dye

comprising two different cyanine residues.

18. (Withdrawn) The method of claim 16, wherein one of the cyanine residues contains S

or O as a heteroatom.

19. (Withdrawn) The method of claim 16, wherein the dye compound is crescent shaped.

20. (Withdrawn, Currently Amended) The method of claim 16, wherein the cyanine dye

has the formula:

KM/REG/ktp

Application No.: 10/605,961 Docket No.: 2921-0150PUS1
Reply of October 25, 2006 Page 8 of 12

Response to Office Action of May 25, 2006

wherein  $A_1$  and  $A_2$  are each independently O, S or N, and R is H or a earbohydrate <u>hydrocarbon</u>, optionally containing a heteroatom, and m is an integer from 0 to 5, and n to an integer from 0 to 5.

- 21. (Original) The method of claim 20, wherein R is methyl or ethyl, and m is 1 and n is 0.
- 22. (Original) The method of claim 20, wherein R is methyl or ethyl, m is 1 and n is 0, and  $A_1$  and  $A_2$  are S.

Application No.: 10/605,961 Docket No.: 2921-0150PUS1
Reply of October 25, 2006 Page 9 of 12

Response to Office Action of May 25, 2006

23. (Original) The method of claim 20, wherein R is methyl or ethyl, m is 1 and n is 0, and  $A_1$  and  $A_2$  are O.

24. (Original) The method of claim 20, wherein R is methyl or ethyl, m is 1 and n is 0,  $A_1$  is S and  $A_2$  is O.